

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

13
7

July 1950

MARKETING ACTIVITIES



U. S. Department of Agriculture
Production and Marketing Administration
Washington 25, D.C.

IN THIS ISSUE:

A LABEL THAT DIDN'T STICK

By M. W. Baker Page 3

Throughout its 22-year growth, the Federal-State inspection of raw products for processing has proved that buying and selling on grade will encourage better production and handling. Mr. Baker, Assistant Director, Fruit and Vegetable Branch, outlines the development and the objectives of the service.

CCC CONTRACT-CRUSHING PAYS OFF

By George L. Prichard and C. D. Walker Page 8

The contract-crushing program is converting raw products into commodities moving readily in domestic and foreign trade. How the contracts are let is explained by Mr. Prichard, Director, Fats & Oils Branch, and Mr. Walker, Director of the Cotton Branch.

BETTER THAN THE HUMAN TOUCH

By L. E. Ide and Amihud Kramer Page 11

Tenderometers, succulometers and such are not designed to eliminate the human element but to aid the inspector, the processor, the grower, or anyone judging quality and maturity of products. Mr. Ide is PMA's representative in the cooperative research being conducted on these devices in the Northeastern States. Dr. Kramer represents Maryland's Agricultural Experiment Station in the work.

SIMPLE REFRACTOMETER DEVELOPED

By W. Haward Hunt, M. H. Neustadt, and Lawrence Zeleny . . Page 15

A simple, hand-held optical instrument gives an accurate measurement of the quality of the oil in flaxseed and soybeans. Technologists Hunt and Neustadt, and Dr. Zeleny, Chief, Standardization Research and Testing Division, Grain Branch, have done the research that has produced this practical instrument.

MILL COSTS CAN BE CUT

By Donald Jackson and Calvin C. Spilsbury Page 18

Some second looks at operating costs in cottonseed-oil mills may pay dividends. A report comparing and analyzing various costs has been prepared by Donald Jackson and Calvin C. Spilsbury of the Research Division, Fats and Oils Branch.

MARKETING BRIEFS Page 20

ABOUT MARKETING Page 23

Address all inquiries to
Norman Hummon
Editor, MARKETING ACTIVITIES
U. S. Department of Agriculture
Washington 25, D. C.

Issued monthly. Vol. 13, No. 7

The printing of this publication has been approved by the Director of the Bureau of the Budget--
March 28, 1950.

Material in MARKETING ACTIVITIES may be reprinted without special permission.

A Label That Didn't Stick

By M. W. Baker

In the canning and processing business we hear a lot about labels--eye-catching labels, labels that whet appetites and labels that arouse curiosity. Most of these labels stick, in one way or another. Let me tell you about one that didn't.

About 20 years ago a prominent Midwestern processor listened patiently to a general description of a new Federal service--inspection of raw products for processing--and then labeled it with three words: "It won't work."

This processor was in earnest, and his reasoning, if not sound, was right to the point. The very heart of his objection centered about a problem we knew we had to lick. You see, this processor figured that the human element would wreck a system that sought uniformity--that in effect, you would have as many standards as you had inspectors.

Some Matters Overlooked

What this critic didn't count on was the high degree of accuracy attainable by competent individuals who have been practically and intensively trained. He didn't figure that candidates for the service would be screened on the basis of background, temperament and health--that inspectors would not simply be men with good eyesight, but individuals with particularly discriminating vision so essential to size and color perception. He didn't measure the value of the systematic schooling and the timely refresher courses given inspectors to get "their sights in line" for a specific commodity. He didn't realize that color determinations would be refined to the point of briefing for variations peculiar to a particular season--that application would be worked out for a special variety in a given area. Finally, he overlooked the value of the technical aids of the inspectors in keeping their decisions in line--the colorimeters, scales, charts, tenderometers, ring gages and life-like models.

Of course there's a happy ending to this episode, but it did take several seasons to convince this processor that the high degree of uniformity was a working reality. Once this was proved to him, he was quick to see the clear-cut advantages of the system for both producer and himself--and at that point his label of "unworkability" was withdrawn.

Where pre-processing inspection is performed by a disinterested party, the grower has the incentive to deliver the best quality of produce possible, for the higher the quality, the better are his returns

providing crop conditions are favorable for good yields per acre. Naturally, under such a system, the canner receives better quality raw products from which to manufacture higher quality finished products.

From the beginning, the service has constantly endeavored to establish grades which are specific enough to reflect variations in commercial value and still simple enough to be adaptable to practical operations. The steady growth of the service, and the increasing dependence placed upon it by both processor and producer is evidence of its unquestionable progress.

Today, inspection of raw products covers 24 commodities in 18 States. Nearly 3,000 highly trained specialists are ready to meet the processing demands, by season, by area, and by commodity. Under a highly synchronized system of personnel training and movement, the force is utilized fully, moving from area to area as the various crops are harvested. While central authority for this manpower shuffling rests in Washington, regional headquarters are strategically located in New York, Chicago, and San Francisco.

Processor Is the Applicant

Conducted cooperatively, under Federal-State agreements, the service is available to any processor whose operations are carried on within the borders of the United States. The applicant, the canner or processor who desires the service, outlines to a representative of the U. S. Department of Agriculture or to his State Department of Agriculture the location of his plant, an estimate of the size and duration of the processing for which he wants inspection, and of course, the commodities involved. Generally, these negotiations are handled through the various State Departments of Agriculture since the responsibility for establishing working conditions and salaries rests largely with the States. In fact, a majority of the functional problems in the service are solved at the State level, while overall supervision, personnel training and licensing are handled through the various Federal supervisors.

Volume inspection of raw products for processing on a contract basis was first performed in Indiana and New York in 1928. Tomato canners in Indiana's and New York's important "tomato belts" were finding it difficult to purchase quality produce in the volume required for their operations. Their attempts to correct this situation through price adjustment and the rejection of deliveries created discontent among producers, particularly those who were attempting to supply the canners with a higher quality raw product.

To the U. S. Department of Agriculture, such a situation was precisely what it had in mind two years before when it established the first standards for an inspection service of this type and conducted preliminary tests to determine their adaptability. In essence, these standards suggested that "Buying and selling on grade would encourage better production and better handling. The practice of paying a flat price for everything which is accepted discriminates against the best growers. The grower should be paid a suitable premium for stock of high quality which

will make a high quality manufactured product. Such stock can be canned at a minimum cost. On the other hand, there should be a suitable penalty for the delivery of culls."

During the preliminary work growers and processors were at first inclined to question the procedure, although they soon realized that it furnished ways and means of securing a higher quality finished product by giving growers incentive to deliver a better raw product.

Within a short time after volume operations started in Indiana and New York, the demand for the service increased rapidly, and by the fall of 1930, a large number of processors were utilizing it. During the 1948 season a total of 2,193,364 tons, or the equivalent to 161,723 carlots of fresh products for processing were inspected. Twenty-four different fruits and vegetables are now being inspected and certified by the service.

The principal commodities, listed roughly by volume in tons handled, are the following: tomatoes, 119,332; oranges, 541,058; pears, 196,303; apples, 114,634; sour cherries, 43,705; grapes, 298,775; peas, 20,473; corn, 12,037 tons.

Wages Vary With State Levels

Processors are charged on a continuous inspection basis and levels vary with the wage standards of the State in which the service is performed. Current rates average between \$75 and \$90 per week for each inspector provided. Of this sum the inspector receives between \$50 to \$75 per week as his salary and the remainder is used to cover charges for overhead and supervision. Equipment is usually furnished by the applicant.

Processors are generally required to give the service two to three weeks notice before the processing actually begins in order for the Department to make the necessary arrangements for inspectors. In addition, all processing companies are expected to arrange contracts for inspection at least two months in advance of the opening date. This does not mean, however, that the force is inflexible and cannot be shifted swiftly to meet emergency calls. There have been cases where a processor has underestimated his need, or where weather conditions have created an unusual ripening rate, and it has been necessary to move sizeable forces upon 72-hour notice. The handling of such manpower problems is under the supervision of the Fresh Products Standardization and Inspection Division of the Fruit and Vegetable Branch, PMA.

Growers Helped Directly

Not all the returns of the service are benefits that occur at the time the raw products are graded and purchased at the plant. Federal supervisors and inspectors also give a great deal of service to growers by demonstrating the application of U. S. standards for the products. For cannery tomato inspection in particular, where color of the tomatoes is such an important factor, inspectors take time at the beginning of the

season to show growers how they should pick in order to receive highest prices. Also, Federal supervisors and inspectors are often called upon to demonstrate the application of standards at picking schools throughout the country. Experience has proved that time spent this way means savings in produce and dollars to both growers and canners.

Problems Have Been Faced

In the continued success and growing acceptance of any service of this nature there is sometimes a tendency to gloss over the problems and mistakes. However, during the years of the program's existence, these problems and mistakes, whether made by growers, processors or the service, have been faced frankly and every effort exerted to solve or correct them.

One of the most difficult problems is that of securing truly representative samples upon which to base the grade determination. This situation, with tomatoes for example, has been more prevalent where very large loads are delivered, many of which are so loaded as to make complete sampling almost impossible unless part of the load is removed. Poor sampling is aggravated where growing conditions and the quality of the crop are irregular within given areas.

Last year, in areas where tomato quality was particularly spotty, arrangements were made to have entire loads made accessible at certain stations. It was found that the percentage of U.S. No. 1's dropped from 15 to 50 percent, varying with different loads, in less than 10 hours. At the same time, loads going to other stations where only the top portion was made accessible, showed little change.

PMA has now adopted the policy that no inspections will be made or certificates issued on loads unless the entire load is made accessible for sampling except in cases of emergency. Grading will be performed then only with the full understanding of both grower and processor that the certificate applies only to the accessible portion of the load and the term "Restricted Inspection" will appear in large letters across the face of the certificate.

That Tricky Tomato Color

There have been other problems connected with this work. For example, in the inspection of tomatoes for processing--an operation which utilizes roughly 800 of the 3,000 Federal licensed inspectors--the determination of the minimum color requirements for the different grades is very difficult and is obviously subject to human error. This problem cannot be settled quickly because of the variables involved. Color ranges vary with seasons and with areas. The problem is further complicated because nothing except the actual item itself looks like a good red-ripe tomato. Color photography has proved too inconstant. Painted models have not proved too satisfactory. This past year plexiglass slides carrying painted tomato slices indicating the minimum color requirements for the various grades have been developed. Constant research is being conducted to develop practical ways and means of utilizing such instruments

as the color difference meter. Work along this line must continue--both to match present needs with the best we can offer and to anticipate and prepare for changing requirements.

Problems in standards vary with different commodities. Producers of sweet corn have a tendency to let the ears get too ripe in an effort to attain maximum weight. Since a top quality finished product cannot be processed from anything except tender corn, some additional grower-education is essential.

While such a difficulty as this one cannot be classified as an "internal" problem of the inspection service, the difficulty must still be worked out. The program has had and will continue to have one major aim--namely, to improve quality through establishing a just compensation for it. The evidence shows that much progress is being made.

Recently the matter of quality in produce has had a significance that extends beyond aesthetic or even wholesome values. It has become an economic consideration. These days processing plants cannot afford to accept low grade products and stay in business. At the same time, the high costs of production for the grower mean that he has to bend every effort to produce and deliver quality produce to the processor. The service stands ready to aid both impartially.

. .
.

INTERNATIONAL SEED ANALYSTS RESUME CONFERENCES AT FIRST MEETING HELD IN UNITED STATES

The International Seed Testing Association held its Ninth Congress --the first one held in the United States--in Washington, D. C., May 8-13. The previous Congress was held in 1937 in Zurich, Switzerland.

The Association is an outgrowth of the European Seed Testing Association which was established in 1921 by informal agreement among sixteen European countries for the purpose of standardizing methods and terms for the analysis of seeds in international trade.

At the 4th Congress held in Cambridge, England, in 1924, the organization was expanded to include other countries.

Representatives from 31 countries were present, as well as the Association of Official Seed Analysts of North America and representatives of the Food and Agriculture Organization of the United Nations.

The Association voted to hold its next Congress in Dublin, Ireland, in 1953. The Congress held in Washington was originally scheduled for 1940, but was canceled because of the war.

New officers elected were Dr. H. A. Lafferty, Department of Agriculture, Dublin, Ireland, President; W. A. Davidson, USDA, First Vice-President; C. C. Brett, Official Seed Testing Station for England and Wales, Cambridge, England, Second Vice-President, and Christian Stahl, Director of Seeds Control, Copenhagen, Denmark, Honorary Secretary-Treasurer.

CCC Contract-Crushing Pays Off

By George L. Prichard and C. D. Walker

The contract-crushing of the Commodity Credit Corporation's oilseed purchases has proved to be good business.

Through crushing contracts with commercial crushers CCC has advantageously cut down its holdings of cottonseed and flaxseed, acquired in carrying out price support operations under the Agricultural Act of 1948 and 1949.

While strengthening prices for both cottonseed and flaxseed have made sales transactions more favorable for the Corporation, there have been other immediate benefits from the program.

Oil Storage Offers Advantages

The advantages of converting CCC stocks of flaxseed into linseed oil are manifold: It helps relieve the pressure on overloaded grain storage facilities and utilizes our ample means of storing oil. Linseed oil can be held for longer periods of time than flaxseed and at lower costs and less risk of spoilage. Substantial crushings of flaxseed utilize the processing equipment of the industry and mean stabilized employment and a healthy turnover of dollars. Important too, is the fact that CCC automatically disposes of a portion of its holdings in the form of linseed meal.

The toll-crushing of cottonseed, based on a different contractual arrangement, offers some of these same benefits. The contract differs in that CCC also retains title to the cottonseed cake or meal, and to the linters, commodities for which the market has recently been fairly strong. Finally, in both operations, domestic processors are converting a raw product into commodities readily available to the domestic and export markets.

Until recently, contracts for flaxseed crushings were negotiated by the Fats and Oils Branch in Washington, but now this function has been assigned to area commodity offices of the Production and Marketing Administration. Under the 1949 cottonseed price support program cottonseed crushing contracts were let by the Dallas and San Francisco offices. Shipping arrangements are also made by area offices for shipments abroad of both linseed and cottonseed oil.

As of June 8, CCC had entered into crushing contracts involving nearly 13.5 million of the more than 24 million bushels of flaxseed acquired under the 1948 price support program. Most of the remaining stocks

of CCC flaxseed are located in the Midwest where they have been stored largely in commercial elevators under regular USDA supervision.

To put the machinery in motion, CCC arranges to sell flaxseed to processors for crushing at a fixed price per net bushel. At the same time, it agrees to purchase the resultant linseed oil produced from the flaxseed at a negotiated price f.o.b. seller's tank cars, or in storage at the processors' plant. Once the flaxseed is crushed, the resultant linseed oil becomes the property of the Corporation, whereas the linseed meal derived from the crushing remains in the possession of the processor.

Quality is Checked Carefully

If the linseed oil delivered to CCC does not meet Federal specifications it may be rejected by the Corporation without the right of replacement, or it may be accepted at a reasonable price discount mutually agreed upon. Quality in both flaxseed and linseed oil is determined by official sampling and analysis. Payments of the purchase price for the resultant linseed oil is made to processors on the basis of official weights at the time of delivery.

Demand for linseed oil has been moderately strong, principally for use as a drying agent in paints and varnishes, linoleum and oilcloth, and in printing inks. The current building boom has been an important factor in the strengthened demand for paints. Linseed meal retained by processors is utilized as a component of livestock feed.

Bulk of Cottonseed Contract-crushed

Under the 1949 cottonseed price support program, CCC purchased approximately 800 thousand tons of cottonseed. Of this quantity, CCC sold approximately 145 thousand tons to domestic crushers and another 1,900 tons for export. As of June 1, contracts had been entered into between CCC and crushers for crushing of about 645 thousand tons of seed. Through these offices the Corporation periodically announces the location of various lots of cottonseed and requests crushing bids. Crushing contracts are issued on the basis of the bids received.

Upon delivery of the cottonseed at the oil mills, representative samples are drawn from each lot for the purpose of chemical analysis. The crushing contracts entered into between CCC and processors provide that the mills will retain the hulls, motes, grabbots, and flues as a part of their crushing fees. The products that must be delivered to CCC under the contract are crude cottonseed oil, first and second cut or mill run linters and cottonseed cake or meal.

The Corporation does not place crude cottonseed oil in storage unless sold for export, in which case the oil may be stored at a port location prior to shipment. Cottonseed oil which is not disposed of outright for domestic use or export is sold to refiners at a flat price under a contract which provides for CCC to purchase the resultant refined oil.

July 1950

9

The price of cottonseed oil has increased substantially since the CCC purchase and contract-processing program was begun last winter. Cottonseed oil is used principally in the manufacture of margarine, salad oils and shortening.

The linseed oil obtained by CCC through its crushing operations is offered for sale through regular monthly announcements which were inaugurated in January 1950. In these announcements, both domestic and export sales prices as well as quantities available for sale are given. Cottonseed oil, both crude and refined, is now sold weekly on a bid and acceptance basis.

Cottonseed cake and meal and linters also are offered for sale on a bid and acceptance basis. As of mid-June, CCC had sold 35.4 million pounds of crude cottonseed oil for export to Germany and Japan and had sold an additional 69.5 million pounds either for domestic use or export to Canada. During the same period, the Corporation also sold 13.1 million pounds of refined cottonseed oil and 171,000 tons of cottonseed cake and meal.

. . .
.

TOBACCO CONSUMPTION RISES

In 1949, expenditures by consumers for tobacco products totaled more than 4.2 billion dollars--the highest on record. This is almost 2 1/2 times the average annual expenditure in the late thirties and the late twenties. Combined Federal and State taxes on tobacco products accounted for about 40 percent of expenditures on tax-paid tobacco products.

Domestic consumption of cigarettes (as measured by tax-paid removals) will probably be near 355 billion cigarettes--approximately 3 billion higher than 1948-49 and a new fiscal year record. United States cigar consumption during 1950 seems likely to be nearly as large as the 5.6 billion in 1949. Smoking tobacco consumption is expected to gain a little over the 1949 figure of 108 million pounds. Chewing tobacco consumption in 1950 may hold close to last year's level at 87 1/2 million pounds. The level of snuff consumption for 1950 may be slightly lower than in 1949 when it was a little more than 41 million pounds. These figures are announced in the Tobacco Situation report for May of the Bureau of Agricultural Economics.

. . .
.

MORE SPRING ONIONS AND LESS CUCUMBERS

Production of spring onions, watermelons, carrots, and green peppers during the 1950 spring season showed enough increase over last year to offset the cuts in production of cucumbers, tomatoes, cabbage, and celery. The June report of Commercial Truck Crops issued by the BAE shows that all in all the total aggregate production of commercial vegetable crops for fresh market harvest is about the same as last year, and about one-sixth above average.

✓ Better Than The Human Touch ✕

By L. E. Ide and Amihud Kramer

Have you ever ordered asparagus in a restaurant only to find it so tough that you could hardly cut it with your fork? If you have you will be glad to know that an instrument has been developed which will enable the grower, the inspector, or the processor to determine the toughness of the asparagus stalks so that the undesirable ones can be kept to a minimum. This instrument is the fibre-pressure tester which operates in the same manner as your fork in testing the toughness of the stalk. The force required to make the cut is registered on the scale by a sliding indicator.

This is one of several devices being tested at the University of Maryland Agricultural Experiment Station at College Park. The experiments, in which the Fresh Products Standardization and Inspection Division, Fruit and Vegetable Branch, is cooperating, have been under way for more than two years and are aimed at the development of objective methods of determining quality of vegetables. This project is conducted in cooperation with the Agricultural Experiment Stations in the Northeastern States under authority of the Research and Marketing Act of 1946.

Mechanical, Not Human Measure

Objective methods of grading are desirable because they are not affected by the factors which are responsible for human error and, within certain limits, the same result can be obtained time after time in testing samples of the same quality. On the other hand, the opinions of different individuals may vary considerably with regard to overall quality or a specific quality factor such as color, firmness, or succulence. Similarly, the judgment of an individual may fluctuate due to any one of several



The asparagus fiber-tester is also used on snap beans.

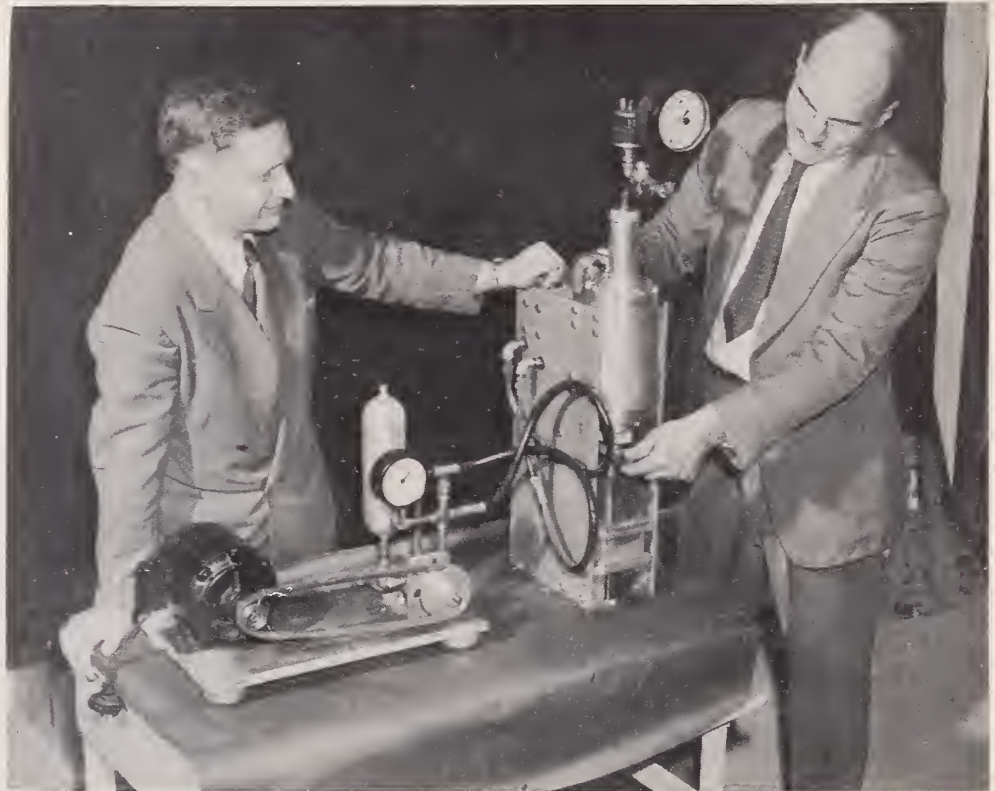
factors such as lighting conditions, the quality of samples previously examined, or fatigue. In some cases experienced or trained personnel may not be available to judge the quality of the product. Quality tests by means of mechanical devices or by chemical analysis are not expected or intended to eliminate the human element in judging quality. Instead they are regarded as aids to the inspector, the processor's field man, the production manager, the grower, or to anyone who is called upon to judge the quality, and particularly the maturity, of a product.

Test Must Be Quick and Reliable

To be useful the quality test must be simple, rapid and reasonably accurate. The average user has no time for a complicated procedure that will hold up production, and certainly he must have a test that is reliable. It is with these requirements in mind that the results of tests with different instruments are compared with one another, with the results of laboratory analyses, with U. S. grades on the canned or frozen samples, and with the ratings by trained taste panels.

Lab Is Mobile

Each season several hundred samples of each of several products including asparagus, peas, sweet corn, tomatoes, and snap beans have been analyzed in the fresh state and after processing. Some of these samples have been grown on the University Plant Research Farm. However, in order to secure samples from all parts of the Northeast Region and at various times during the growing season, the University of Maryland has provided a mobile laboratory which is virtually self-sufficient. It carries its own electric power plant, water supply, bottled gas, refrigeration and deep freeze units, and complete equipment to make practically any laboratory analysis and to can or freeze samples at any location at which it may be desirable to operate.



The designer of the "miniature tenderometer," George J. Burkhardt, (right) Department of Agricultural Engineering, University of Maryland, and Dr. Kramer display their new device.

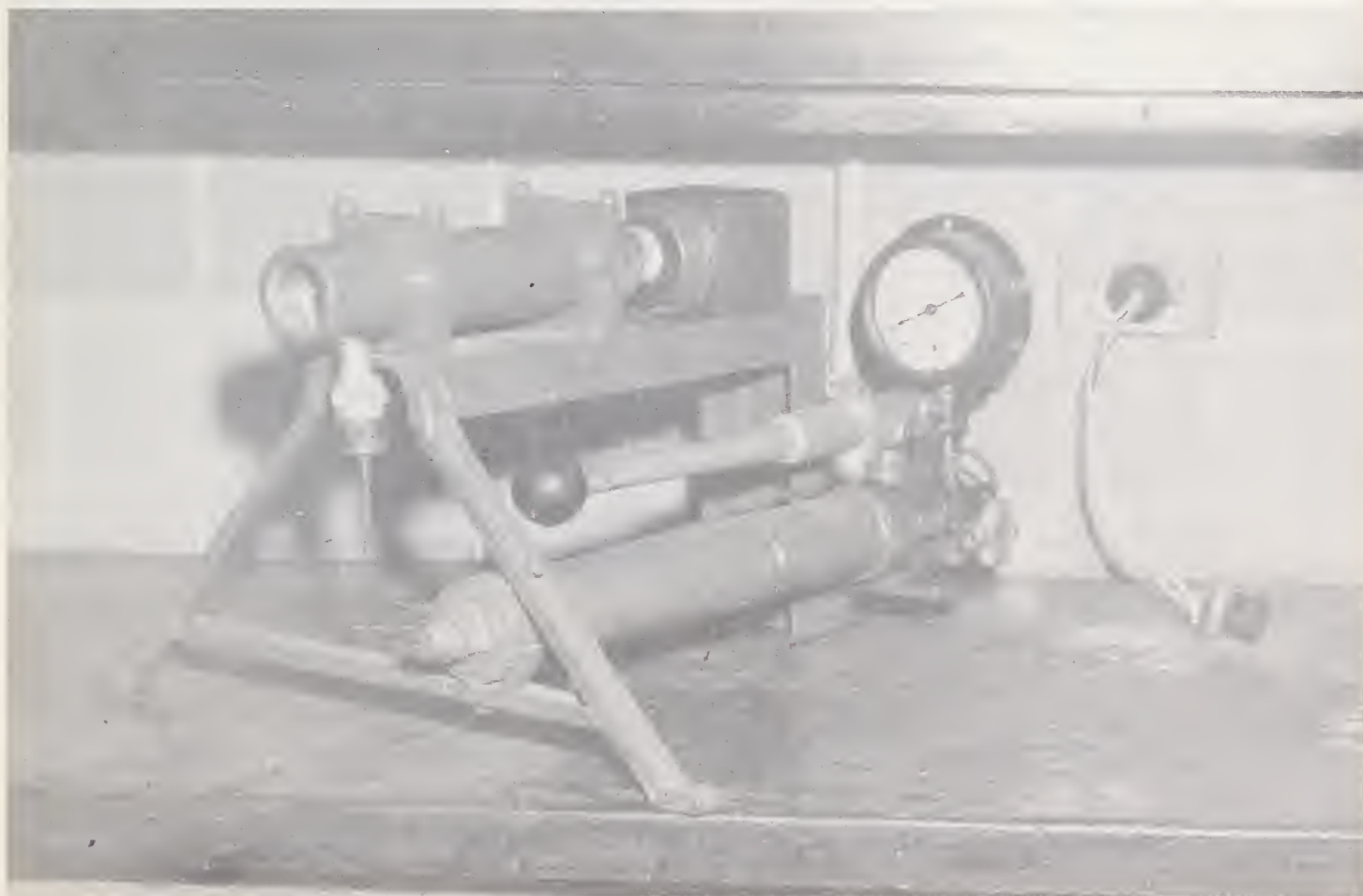
Fruit Pressure Tester Modified

One of the devices used in these experiments is the asparagus fiber-pressure tester--an adaptation of the fruit pressure tester which has been used for many years to determine the maturity of apples and other

fruits. The plunger used for testing fruit was replaced with a stainless steel blade. The U. S. Standards for green asparagus for canning or freezing have no requirements as to toughness or fibrousness but specify that a certain length of the stalk must be of a green color. In most instances that portion of the stalk that is green is also free from excessive fibre at the length used by the processor. That is not always the case, however, and processors thus find it difficult to determine the amount of sorting required for a particular lot. By using the fiber-pressure tester on a representative sample of stalks the relative fibrousness of any lot may be quickly determined, and the canner will know how much of the lot will be usable; whether it will pay to sort out and pack "center cuts" or whether everything beyond the first cut, which is usually made at from 3 3/4 to 5 inches from the tip, must be discarded. This instrument is currently being tested under commercial conditions through the cooperation of processors in Maryland, Delaware, and New Jersey, and the Federal-State Inspection Service.

Juice Content Diminishes with Maturity

The succulometer--a device which measures the amount of "juice" in a product--is used principally to determine the maturity of raw sweet



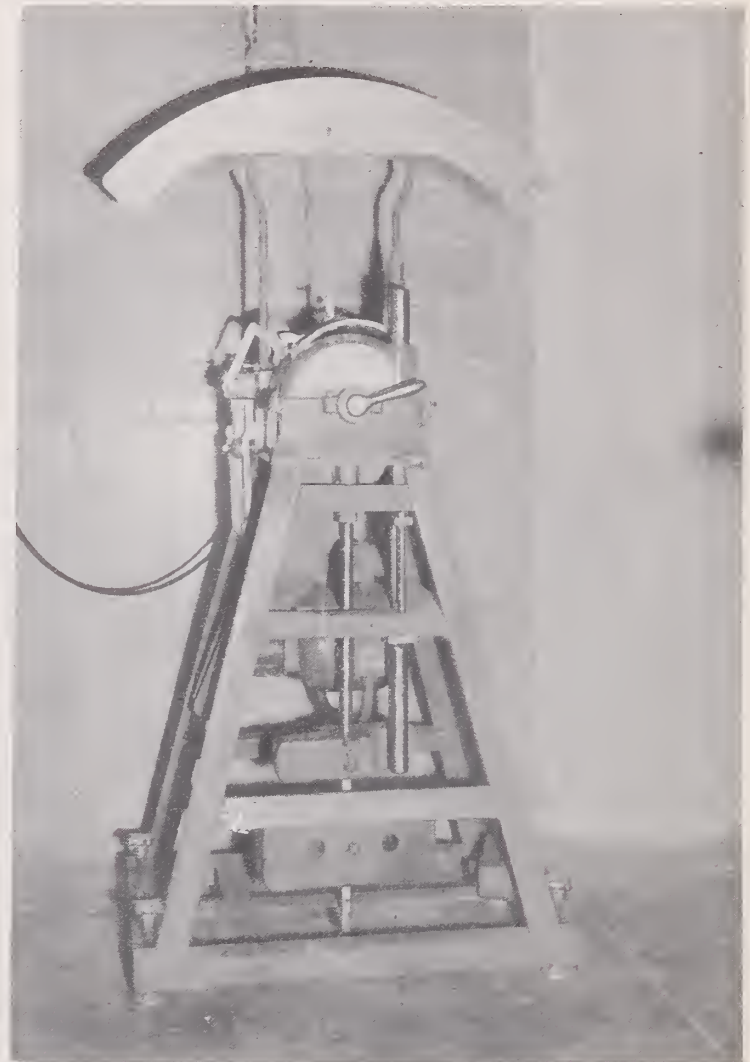
Much like a small, horizontal cider press, the succulometer measures juice content of sweet corn.

corn. It consists of a steel cup which holds the sample of kernels and into which a plunger is driven at high pressure, squeezing out the juice. The quantity of juice which is extracted from the sample is an indication of the maturity of the corn. As the maturity advances, less juice will be extracted. The succulometer was developed at the University of

Maryland several years ago and has found increasing use by processors in determining the quality of raw sweet corn and in predicting the probable quality of the canned or frozen product. It has also shown promise in measuring the quality of other products.

Need for Simple Standardized Tenderometer

Canners and freezers of peas have for a number of years used mechanical devices for determining the maturity of the raw product, both as a basis of payment to the grower, and as a guide to the separation of lots on the basis of maturity at the plant. In some States the Federal-State inspection service operates these devices and reports the maturity values based on the tests in connection with, or in place of, the results of the inspection based on the U. S. Standards for fresh shelled peas for canning or freezing. The most accurate of these machines is the tenderometer, which measures the force required to shear or crush a sample of peas. Nevertheless there is a definite need for a simple, portable, easily standardized, but reasonably accurate machine for this purpose. Now the University of Maryland has developed an instrument which up to the present time has been named only the "miniature tenderometer." It also operates on the principle of shearing the peas. Preliminary tests indicate that it meets all of the above requirements and it will be tested throughout the Northeast Region during the 1950 season. Inquiries have already been received from members of the processing industry regarding its availability for commercial use. This machine will not only be less expensive than the tenderometer but through the use of interchangeable sample boxes, blades and plungers becomes a multi-purpose tester which can also be used as a succulometer to test corn, or it can be used to test several stalks of asparagus or pods of beans at one time.



Processing plants use the tenderometer to measure the maturity of peas.

Specifications Available

Any one who wishes to make use of any mechanical device developed in the course of these experiments is free to do so. Specifications for manufacture are also made available. Inasmuch as the cooperating agencies are supported by public funds, it is desired that developments arising from this work be available to all possible users. As these instruments are developed they are photographed and the findings published so that they become public property.

✕ Simple Refractometer Developed ✕

By W. Haward Hunt, M. H. Neustadt
and Lawrence Zeleny

A new device--a hand refractometer--has been developed for the simple rapid testing of flaxseed and soybeans for the quality of their oils as measured by "iodine number." The new refractometer is well adapted to general usage because of its low cost of about \$225, and because no particular skill is required to operate it. The refractometer that has been in general use costs, with accessories, about \$2,000.

This new device has been developed by the Production and Marketing Administration of the U. S. Department of Agriculture. The original idea and its application were worked out at the Beltsville Laboratories of the Grain Branch under authority of the Research and Marketing Act of 1946.

"Iodine Number" Defined

The oil derived from soybeans is used principally for food and, to a lesser extent, in paints, and the oil from flaxseed is used principally in paints and varnishes. The suitability of an oil for paints or varnishes depends largely on its "drying" properties--which properties in turn depend on its ability to combine with the oxygen of the air to form a hard film. Iodine will react with oils in about the same way as oxygen but very much more rapidly. The amount of iodine that will react with a given quantity of oil can be measured rather readily and is a useful index of the suitability of the oil for paints and varnishes or for food purposes. Thus the "iodine number" of an oil is the number of centigrams of iodine that will combine chemically with one gram of the oil under certain specified conditions.

Oils with high iodine number are preferred for paints and varnishes because they will dry more quickly and produce a harder film. Oils with low iodine numbers, on the other hand, are generally preferred for edible purposes because they are less susceptible to rancidity resulting from oxidation.



Hand-operated refractometer, used to make a simple, rapid test of the quality of flaxseed oil and soybean oil.

Although several investigators had previously shown that there was a relationship between the iodine number and the refractive index of certain oils, the practicability of using the refractive index of a freshly prepared vegetable oil from sound plant material as a relatively accurate measure of its iodine number was first demonstrated in 1935 by the Grain Branch of the Department in experimental work with flaxseed. The refractometric method for determining oil iodine numbers was later applied to soybeans at the Branch's Beltsville Laboratories.

Subsequent studies with many types of oilseeds indicate that the refractometric method of determining iodine number may apply to many other vegetable oils. The determination of the refractive index of a liquid is a relatively simple procedure, namely, the placing of the liquid on the prism face of the refractometer and reading the point where the light and dark fields meet in the viewing telescope.

Cost Limits Use of Customary Refractometer

The refractometer used in the above studies and as now used by many laboratories and industries is quite expensive and requires a skilled technician to operate it. The refractometer with accessories, including a constant temperature bath, hydraulic press, etc., costs approximately \$2,000. This has greatly limited the use of the refractometric method even though it is a very rapid and accurate procedure. It seemed feasible that a compact, portable, hand-held refractometer of adequate sensibility could be developed which would accurately measure the refractive index of soybean oil and flaxseed oil and, since the relationship between refractive index and iodine number has been well established, this refractometer could have a scale calibrated directly in iodine-number units.

The possibility of developing such an instrument was discussed in detail with engineers of the Bausch and Lomb Optical Company. The idea was considered practical and such an instrument was designed and produced. This instrument is a simple, accurate, hand refractometer which can be used by anyone having little technical experience. Since the refractive index of the oil changes markedly with changes in temperature (equivalent to about three iodine numbers per degree centigrade), a sensitive thermometer is embedded in the body of the instrument as close as possible to the prism. This thermometer is calibrated directly in iodine-number corrections instead of degrees of temperature.

The Test Is Simple

The procedure for the determination of the iodine number of the oil in soybeans or flaxseed with the use of this refractometer is very simple. A sample of the seed is placed in the cylinder of a laboratory hydraulic press and pressure is applied to obtain a few drops of oil. The oil is transferred with a medicine dropper to the prism of the refractometer and the iodine number is read through the eyepiece of the refractometer as that sharp division where the light and dark fields meet on the scale in the objective field. The readings are taken by holding the refractometer toward almost any source of light. Iodine-number corrections due to temperature are observed on the thermometer and added to or sub-

tracted from the instrument reading as indicated on the thermometer. After each use the prism face is first cleaned carefully with absorbent cotton dipped in alcohol and then again with dry cotton.

Deviations Well Within Error Limit

A comparison of iodine numbers obtained by the use of the hand refractometer on a large number of samples with the iodine numbers of the same samples obtained by the use of a precision refractometer shows an average deviation of only 0.3 iodine number. Since iodine-number determinations are usually subject to errors of the order of about plus or minus one unit, the accuracy of the new hand refractometer is well within the usual limit of error.

In comparison with the precision refractometer, the expense of making iodine-number determinations with the hand refractometer is small indeed. The hand iodine-number refractometer can be purchased for \$225 and the necessary accessories cost from \$100 to \$200, depending upon whether a home-made or commercially available hydraulic press is used. Oil iodine-number determinations of flaxseed or soybeans can be made in approximately five minutes with this equipment and no special skill is required for its use.

• •
•

PROPOSED HOG GRADES ARE DEMONSTRATED

Full cooperation from three of the Nation's major midwestern hog marketing centers has paved the way for demonstrations of the new tentative hog grades being proposed by the Livestock Branch of the Production and Marketing Administration. C. L. Strong, of the Branch's standardization and grading division, has thus far conducted demonstrations at St. Joseph, Mo., Sioux City, Iowa and at South St. Paul, Minn.

The demonstrations, conducted under the sponsorship of the livestock exchanges at these centers, include examination of the carcasses produced by the graded hogs to bring out the relationship of the carcass to live hogs. A complete analysis of the proposed five new grades, published in the February issue of MARKETING ACTIVITIES, is available upon request to the Editor.

• •
•

FARMERS WORKING ABOUT 12 HOURS A DAY--A LITTLE LESS THAN USUAL

According to BAE's June report on Farm Labor, farm operators were putting in 11.7 hours per day at farm work around the first of June. This was slightly less than a year ago. Hired farm workers were also working a little less time per day as they worked 9.7 hours. Farmers in North Dakota, however, had to work 13.7 hours per day to complete work delayed by floods.

✓ Mill Costs Can Be Cut

By Donald Jackson and Calvin C. Spilsbury

Some hints to cottonseed processors on ways to reduce the cost of operating their mills are offered in a report just issued by the Production and Marketing Administration on the basis of a study of operating methods and practices in the industry. Information made available by the National Cottonseed Products Association formed the principal basis for the study.

The research shows that there are very great opportunities for reducing costs in processing cottonseed. That situation prevails, of course, in other industries also; but, as a result of this study, it is expected that cottonseed processors will be in a better position to do something about it.

Concentrate Economy Moves

Summing up some of its findings, the Fats and Oils Branch of PMA, which made the study under authority of the Research and Marketing Act, has this to say, in substance: Most high-cost mills have only one cost item that is unusually high, or only a very few cost items that are high. Most low-cost mills keep all their items of cost on an economical basis. Therefore, the manager of a high-cost mill often can get his total costs down to a good level by concentrating his efforts on reducing the one item, or the few items, that are high.

In most of the cost categories, PMA has found the highest costs are more than double the lowest. This is not unique for the cottonseed oil milling industry, but the variation is so great that there is tremendous opportunity for a high-cost mill--and for any mill with certain high costs--to improve its practices and hence its position.

The PMA study covered more than one-third of the cottonseed processing plants in operation during the 1947-48 season. Few dollar figures on costs are included, but each type of cost is expressed as a percentage of total costs of the mill.

This permits a mill to measure, for example, the percentage that its plant repair cost is of its total costs, in comparison with the average for all mills. If its repair costs are much higher percentage of total costs than the average for all plants, the mill manager may well look to the problem of reducing his repair bills. Similar comparisons can be made for cost items such as labor, heat and light, power, cottonseed, salaries, office and administrative cost, depreciation, taxes, licenses, insurance, travel and minor costs.

An example of the amount of variation in costs is provided in the category of "bulk costs". Bulk costs include current costs such as labor, power, heat and light, repairs and minor operating costs, and fixed and general costs such as salaries, office expense, depreciation, taxes, licenses, insurance and travel. In the lowest-cost mills, the bulk costs were found to be not more than half of what they were in the highest-cost mills.

Total processing costs were found to show little correlation with the level of seed costs. There was a definite indication that the labor cost of processing lower-cost seed was more than that for higher-cost seed. Therefore, it obviously is desirable to encourage cotton farmers, ginner, and processors to follow practices that will hold the quality of seed as high as possible to avoid lowering the value of the products and increasing processing costs.

On the basis of the findings in this study, it may be generally concluded that there is no greater profit in processing one quality of seed than there is in processing another. Competition seems to adjust the seed price to a point where processing returns are equalized.

Comparisons are made of costs in three regions, the Southeast, the Mississippi Valley and the Southwest. Charts and tables in the report show the relationships of five major cost categories for the three regions: bulk costs, current, fixed and general, labor, and cottonseed, besides total.

The report offers a valuable guide for mill operators, who can make comparisons of their own practices and cost relationships with those that characterize the other segments of the industry, and adjust their operations accordingly.

A copy of the report, "Distribution of Marketing and Processing Costs of Cottonseed-oil Mills, 1947-48," may be obtained from the Information Branch, PMA, of the U. S. Department of Agriculture, Washington 25, D. C.

* * *

PRESTON RICHARDS TO HEAD PMA DAIRY BRANCH

Appointment of Preston Richards as director of the Dairy Branch, Production and Marketing Administration of the U. S. Department of Agriculture, was announced recently by Ralph S. Trigg, PMA Administrator.

Philip E. Nelson, who has headed the Dairy Branch since October 1948, is transferring to the PMA Administrator's Office as special Assistant to Administrator Trigg.

Since December 1948, Mr. Richards has been assistant director of the PMA Livestock Branch, which he has represented in the foot and mouth disease eradication work in Mexico, and in various other important administrative assignments.

Marketing Briefs

Dairy.--The Production and Marketing Administration of the U. S. Department of Agriculture has announced that limited quantities of butter and cheese acquired by the Commodity Credit Corporation under mandatory price support programs have been made available for donation to private welfare agencies for the assistance of needy persons outside the United States. These products already are available for distribution to various Federal agencies and for donation to School Lunch Programs, the Bureau of Indian Affairs, and to both public and private welfare agencies for the assistance of needy persons in this country. The Department on April 14 announced the availability of butter and cheese for domestic donation. The action offering butter and cheese for the relief of needy persons in foreign countries was taken under the provisions of Section 416 of the Agricultural Act of 1949. Donations for distribution abroad are authorized under the last priority named in the Act.

PMA announced June 8 that arrangements have been completed to sell approximately 50 million pounds of Government-owned nonfat dry milk solids to the Japanese Government for use chiefly in school lunch and child feeding programs. Department officials stated that the sale of this quantity will help provide an outlet for surplus supplies which have been acquired under the 1949-50 price support program for manufacturing milk. Approximately 500 million pounds of nonfat dry milk solids have been bought for price support by the Commodity Credit Corporation during the past 14 months. Unsold stocks, totaling approximately 300 million pounds will be reduced to about 250 million pounds as a result of this transaction. Department officials expect that the 50 million pounds sold to Japan will be shipped during the next few months. None of this quantity will be sold in commercial trade channels in Japan.

Fruits and Vegetables.--The Production and Marketing Administration of the U. S. Department of Agriculture announced June 2 that potato growers in Delaware and counties of Worcester, Somerset, Wicomico, Dorchester, Talbot, Caroline, Queen Annes, Kent, and Cecil in Maryland have rejected a proposed marketing order in a referendum which was conducted throughout the production area during the period May 22-26, 1950, inclusive. Therefore, the proposed marketing agreement and order program will not go into effect and, as required by the law, price support on 1950 crop potatoes will not be available to Delaware and Eastern Shore of Maryland potato producers....PMA announced May 29 an amendment to the walnut diversion program to encourage the diversion of an additional quantity of walnuts to outlets other than those constituting their normal channels of trade. An additional quantity of unshelled walnuts equivalent to 3 million pounds of kernels may be diverted under the amendment announced today. This brings the total quantity which may be diverted under the program up to 8.5 million pounds (shelled equivalent). The rate of payment to encourage such additional diversion will be not more than 10 cents per

pound of unshelled walnuts (basis, walnuts containing 40 percent kernels). The previously established rate of payment was 10 cents per pound of unshelled walnuts (basis, walnuts containing 25 percent kernels). The Production and Marketing Administration of the U. S. Department of Agriculture announced June 9 the extension of the period for making sales under the Dried Fruit Export Program from June 30 to August 31, 1950. This action was taken to permit uninterrupted export business throughout the 1949-50 marketing season....PMA, on June 14, announced extensions of the periods for making sales, filing Notices of Intention, and exporting fresh and processed oranges under the orange export subsidy program to September 15, September 17, and September 30, 1950, respectively. Program termination dates as originally established were June 15, 17, and 25, respectively. Also, Singapore and The Federation of Malaya have been added to the list of eligible destinations under this program.

Fats and Oils.--The Production and Marketing Administration of the U. S. Department of Agriculture announced on June 14 that a contract has been signed with John W. McCutcheon, a private industrial consultant in New York City, to study existing and potential market outlets for fats and oils of domestic agricultural origin. Since the war, consumption of domestic fats and oils has not kept pace with the increased supply. This research is designed to discover or develop additional market outlets for the large supply. The major emphasis of the study will be on inedible fats and oils. The research was initiated following recommendations of the commodity advisory committees established under the Research and Marketing Act of 1946. Funds were appropriated by Congress specifically for this type of work under the terms of that Act. This project is part of a larger program of research being conducted by the Department of Agriculture for development of new and expanded market outlets for fats and oils of domestic agricultural origin.

Grain.--The Production and Marketing Administration announced June 1 that during the period May 24 to May 30, 1950, inclusive, the Commodity Credit Corporation confirmed sales of 3,833,000 bushels of wheat (including wheat and wheat flour in wheat equivalent) under the International Wheat Agreement against 1949-50 quotas. The sales included 153,000 hundredweight of flour (355,000 bushels of wheat equivalent) and 3,478,000 bushels of wheat. Principal buyers were Italy, Greece, Philippines, Netherlands, and Belgium. The cumulative sales of United States wheat and flour from August 1, 1949 through May 30, 1950 are 145,246,000 bushels....Purchase of 15,990,000 pounds of hard wheat plain flour (372,567 bushels of wheat equivalent) for shipment from mills on or before June 30, 1950 to Gulf and West Coast Ports for export to Austria, was announced June 6 by PMA of the U. S. Department of Agriculture. Offerings by mills on this purchase totaled 159,100,000 pounds (3,707,030 bushels of wheat equivalent). Purchases of wheat flour July 1, 1949 through June 6 now total 325,757,800 pounds (7,185,123 bushels of wheat equivalent).

Livestock.--The Production and Marketing Administration recently announced bids for government purchase of approximately 1,350,000 pounds of refined or unrefined lard for the Department of the Army for shipment to Okinawa. Since last December, lard purchases have amounted to 149.5 million pounds. The bulk of these purchases were under ECA requisitions

for export to Germany and Austria with smaller amounts for Okinawa and Japan.

Sugar.--The Production and Marketing Administration of the United States Department of Agriculture announced in mid-June the proration of an additional quota deficit of 150,000 tons in prospective marketings of Philippine sugar in the continental United States in 1950. This additional amount of quota accordingly has been prorated to Cuba and other foreign countries which supplied rawsugar to the United States market in 1949. The adjusted quotas for the countries affected by this proration are in short tons, raw value: Philippines - 532,000; Cuba - 2,646,900; Dominican Republic - 8,123; Haiti - 1,123; Mexico - 7,348; Peru - 13,539. These new quotas represent the following increases: Cuba - 142,500 tons; Dominican Republic - 2,022 tons; Haiti - 279 tons; Mexico - 1,829 tons; and Peru - 3,370 tons. These additional quantities may be entered only as raw sugar.

* * *

STATUS OF CCC PRICE-SUPPORT PROGRAM AS OF APRIL 30, 1950:

Ralph S. Trigg, president of the Commodity Credit Corporation, U.S. Department of Agriculture, reported May 31 that \$3,958,328,000 was invested in CCC price support program loans and inventories as of April 30, 1950, and that the Corporation sustained a net realized loss of \$155,322,000 in carrying out this program during the current fiscal year through April. (The net realized loss on the CCC price support program for the fiscal year ended June 30, 1949, was \$254,000,000.)

Of the total investment of \$3,958,328,000, loans outstanding totaled \$1,947,241,000 (including \$737,125,000 of commodity loans held by lending agencies, \$1,190,493,000 held by the CCC, and \$19,623,000 of loans approved but not fully processed) while inventories acquired under loan, purchase agreement, and direct purchase operations represented an investment of \$2,011,087,000.

Price-support operations in four commodities accounted for the bulk of the loan total. These commodities, the quantities of collateral pledged, and the loans outstanding, were as follows:

Corn	543,155,412 bu. <u>1/</u>	\$742,342,652
Wheat	304,635,250 bu.	604,142,625
Cotton	2,000,372 bales	283,328,533
Tobacco	331,674,342 lbs.	132,796,135
Other	<u>XXX</u>	<u>184,630,653</u>
Total	XXX	\$1,947,240,598

Included under "Other" above were loans on flaxseed, peanuts, soybeans, lespedeza seed, potatoes, barley, dry edible beans and peas, grain sorghum, oats, rice, rye, American-Egyptian cotton, and cottonseed. In this group, the largest amount of loans on any one commodity was \$48,010,213 on dry edible beans.

1/ Includes, in addition to 306,011,200 bushels of 1949-crop corn, 102,692,686 bushels of re-sealed 1948-crop corn, and 134,451,526 bushels of 1948-crop corn in process of transfer to CCC inventories.

ABOUT MARKETING

The following address and publications, issued recently, may be obtained upon request. To order, check on this page the publications desired, detach and mail to the Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

Address:

Farm Price Supports in the National Interest, by Ralph S. Trigg, President of the Commodity Credit Corporation and Administrator of the Production and Marketing Administration, U. S. Dept. of Agriculture, at the meeting of the National Cottonseed Products Assn., Houston, Texas, May 17, 1950.

Publications:

Price Programs of the United States Department of Agriculture. AIB-13. April 1950. 65 pp. (PMA) (Printed)

Carlot Shipments of Fresh Fruits and Vegetables by Commodities, States, and Months, including boat shipments reduced to carlot equivalents, Calendar Year 1949. May 1950. 25 pp. (PMA) (Processed)

A Comparison of Two-Wheel Hand Trucks and Clamp-Type Industrial Trucks for Transporting Uncompressed Bales of Cotton From Blocked Area to Dinky Press. May 1950. 7 pp. (PMA) (Processed)

Irish Potatoes, Price Support and Related Operations, Commodity Credit Corporation and Section 32 Funds, Jan. 1, 1943--Dec. 31, 1949. March 14, 1950. 29 pp. (PMA) (Processed)

State and Territorial Departments of Agriculture and Marketing Agencies with Names of Officials. May 1950. 8 pp. (PMA) (Processed)

A Disc Method of Filtration of Roller Process Nonfat Dry Milk Solids, May 1950. 13 pp. (PMA) (Processed)

An Improved Method of Stacking Standard Density Bales of Cotton in "Cordwood" Arrangement. May 3, 1950. 7 pp. (PMA) (Processed)

Carlot Unloads of Certain Fruits and Vegetables in 100 Cities and Imports in 5 Cities for Canada, Calendar Year 1949. April 1950. 105 pp. (PMA) (Processed)

United States Standards for Grades of Canned Apple Juice, Effective June 26, 1950. 7 pp. (PMA) (Processed)

ABOUT MARKETING (Cont'd)

U. S. Standards for Cantaloups, Effective June 8, 1950, 3 pp. (PMA)
(Processed)

Distribution of Marketing and Processing Costs of Cottonseed-Oil
Mills, 1947-48. May 1950. 89 pp. (Processed)

Marketing Agreements for Fruits and Vegetables. May 26, 1950. 7 pp.
(PMA) (Processed)

• •
•

(Be certain that you have given us your name and full address when
ordering statements or publications. Check only the individual items
you desire.--Editor)

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____